09-20-00

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UTILITY PATENT APPLICATION TRANSMITTAL
(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No.	ICOR-002
First Inventor or Application Identifier	Handa, et al.
Title	Method and System of Managing Credit
Express Mail Label No.	EL636424161US

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. [X] * Fee Transmittal Form (e.g., PTO/SB/17)
(Submit an original and a duplicate for fee processing)

2. [X] Specification [Total Pages 24]
(preferred arrangement set forth below)
- Descriptive title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix
- Background of the Invention
- Brief Summary of the Invention
- Brief Description of the Drawings (if filed)
- Detailed Description
- Claim(s)
- Abstract of the Disclosure

3. [X] Drawing(s) (35 U.S.C. 113) [Total Sheets 12]

4. Oath or Declaration [Total Pages 4]
   a. [X] Newly executed (original or copy)
   b. [ ] Copy from a prior application (37 C.F.R. § 1.63(d))
   (for continuation/divisional with Box 16 completed)
      i. [ ] DELETION OF INVENTOR(S)
      Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

* NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

5. [ ] Microfiche Computer Program (Appendix)

6. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)
   a. [ ] Computer Readable Copy
   b. [ ] Paper Copy (identical to computer copy)
   c. [ ] Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. [X] Assignment Papers (cover sheet & document(s))

8. [ ] 37 C.F.R.§3.73(b) Statement (when there is an assignee) [ ] Power of Attorney

9. [ ] English Translation Document (if applicable)

10. [ ] Information Disclosure Statement (IDS)/PTO-1449 [ ] Copies of IDS Citations

11. [ ] Preliminary Amendment

12. [X] Return Receipt Postcard (MPEP 503) (Should be specifically itemized)

13. [X] * Small Entity Statement(s) (PTO/SB/09-12) [ ] Statement filed in prior application, Status still proper and desired

14. [ ] Certified Copy of Priority Document(s) (if foreign priority is claimed)

15. [ ] Other: ....
....
....

16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment:
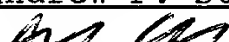[ ] Continuation [ ] Divisional [ ] Continuation-in-part (CIP) of prior application No: _____/_____
Prior application information: Examiner _____ Group / Art Unit: _____
For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation <u>can only</u> be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

[ ] Customer Number or Bar Code Label
(Insert Customer No. or Attach bar code label here)
or [X] Correspondence address below

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Name (Print/Type)	Andrew F. Strobert	Registration No. (Attorney/Agent)	35,375
Signature	*[signature]*	Date	9/19/00

PTO/SB/17 (08-00)
Approved for use through 10/31/2002. OMB 0651-0032
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FEE TRANSMITTAL
for FY 2000

Patent fees are subject to annual revision.

Complete if Known	
Application Number	
Filing Date	
First Named Inventor	Handa, et al.
Examiner Name	
Group Art Unit	
Attorney Docket No.	ICOR-002

TOTAL AMOUNT OF PAYMENT ($) 505.00

METHOD OF PAYMENT (check one)

1. [X] The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:

Deposit Account Number: 19-2385

Deposit Account Name:

[X] Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

[X] Applicant claims small entity status. See 37 CFR 1.27

2. [ ] Payment Enclosed:
[ ] Check [ ] Credit card [ ] Money Order [ ] Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee ($)	Fee Code	Fee ($)		
101	690	201	345	Utility filing fee	345-
106	310	206	155	Design filing fee	
107	480	207	240	Plant filing fee	
108	690	208	345	Reissue filing fee	
114	150	214	75	Provisional filing fee	

SUBTOTAL (1) ($) 345.00

2. EXTRA CLAIM FEES

	Extra Claims		Fee from below	Fee Paid
Total Claims	29 -20** =	9	X $9- =	81-
Independent Claims	4 - 3** =	1	X $39 =	39-
Multiple Dependent			=	

**or number previously paid, if greater; For Reissues, see below

Large Entity		Small Entity		Fee Description
Fee Code	Fee ($)	Fee Code	Fee ($)	
103	18	203	9	Claims in excess of 20
102	78	202	39	Independent claims in excess of 3
104	260	204	130	Multiple dependent claim, if not paid
109	78	209	39	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 120.00

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee ($)	Fee Code	Fee ($)		
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for *ex parte* reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	380	216	190	Extension for reply within second month	
117	870	217	435	Extension for reply within third month	
118	1,360	218	680	Extension for reply within fourth month	
128	1,850	228	925	Extension for reply within fifth month	
119	300	219	150	Notice of Appeal	
120	300	220	150	Filing a brief in support of an appeal	
121	260	221	130	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive - unavoidable	
141	1,210	241	605	Petition to revive - unintentional	
142	1,210	242	605	Utility issue fee (or reissue)	
143	430	243	215	Design issue fee	
144	580	244	290	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Petitions related to provisional applications	
126	240	126	240	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	40-
146	690	246	345	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	690	249	345	For each additional invention to be examined (37 CFR § 1.129(b))	
179	690	279	345	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify) _____

* Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 40.00

SUBMITTED BY

Name (Print/Type)	Andrew F. Strobert	Registration No. (Attorney/Agent)	35,375	Telephone	212-735-3000
Signature				Date	9/19/00

Complete (if applicable)

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

Burden Hour Statement: This form is estimated to take 0 2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

STATEMENT CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) & 1.27(c))--SMALL BUSINESS CONCERN	Docket Number (Optional) ICOR-002

Applicant, Patentee, or Identifier: __Handa, et al.__

Application or Patent No.: _____

Filed or Issued: _____

Title: __Method and System of Managing Credit for the Electronic__
 __Trading of Financial Instruments__

I hereby state that I am

☐ the owner of the small business concern identified below:

☒ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF SMALL BUSINESS CONCERN __ICor Brokerage Inc.__

ADDRESS OF SMALL BUSINESS CONCERN __500 Fifth Avenue, Suite 415__
 __New York, NY 10110__

I hereby state that the above identified small business concern qualifies as a small business concern as defined in 13 CFR Part 121 for purposes of paying reduced fees to the United States Patent and Trademark Office. Questions related to size standards for a small business concern may be directed to: Small Business Administration, Size Standards Staff, 409 Third Street, SW, Washington, DC 20416.

I hereby state that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention described in:

☒ the specification filed herewith with title as listed above.

☐ the application identified above.

☐ the patent identified above.

If the rights held by the above identified small business concern are not exclusive, each individual, concern, or organization having rights in the invention must file separate statements as to their status as small entities, and no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d), or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern, or organization having any rights in the invention is listed below:

☒ no such person, concern, or organization exists.

☐ each such person, concern, or organization is listed below.

Separate statements are required from each named person, concern or organization having rights to the invention stating their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

NAME OF PERSON SIGNING __Neil A-Chriss__

TITLE OF PERSON IF OTHER THAN OWNER __President and COO__

ADDRESS OF PERSON SIGNING __ICor Brokerage, 500 Fifth Avenue, Suite 415, NY 10110__

SIGNATURE _____ DATE __12 Sept-2000__

CERTIFICATE OF MAILING 37 CFR 1.10

I hereby certify that the attached Provisional Application and the documents referred as enclosed therein are being deposited with the United States Postal Service as "Express Mail Post Office to Addressee" **Express Mail No. EL636424161US** addressed Box Patent Application, Assistant Commissioner of Patents, Washington, DC 20231 on September 19, 2000.

By: *Meredith Taylor*

Name: Meredith R. Taylor
Date Signed: September 19, 2000.

METHOD AND SYSTEM OF MANAGING CREDIT FOR
THE ELECTRONIC TRADING OF FINANCIAL INSTRUMENTS

FIELD OF THE INVENTION

5   This invention generally relates to computerized brokerage systems and more particularly, to the electronic trading of financial instruments between various counterparties having unilateral or bilateral credit relationships.

BACKGROUND

When financial instruments, such as those listed in Table 1, are traded, the credit worthiness of the opposing counterparty is important because obligations of one or both parties under such financial instruments may extend up to and beyond thirty years. Each of the parties may be exposed to risk based upon the ability of a counterparty to fulfill its obligations. The resulting credit exposure over the life of a contract is potentially an unknown amount. Therefore, trading parties have a significant interest in limiting credit exposure.

In a typical "conversational" trading desk scenario in which traders enter and act on orders over the telephone, a credit officer for each trading entity assigns credit lines for each potential counterparty. An intermediary broker is used to match bids and offers between various parties. Once two parties are matched, credit officers for both parties then determine whether to approve the transaction based on the opposing party's credit limit. Alternatively, the broker may maintain a list of which entities each party is willing to trade with, and only match parties who are cleared to deal with one another.

F/X Products
  American and European Options
    Calls
    Puts
    Risk Reversals and Straddles
    Strangles
  Exotic Options
    Knock-ins/outs
    Reverse knock ins/outs
  Other Instruments
    Forwards

Fixed Income Products
    Swaps
        Swap spreads (traded with treasury hedge)
        All-in rate swaps
        Spread switches
        All-in-rate switches
        1-3,3-6,1-6 month LIBOR basis swaps
        CP-3 month LIBOR basis swaps
    Forward Rate Agreements
        1/3/6 month LIBOR
        FRA Switches
    Swaptions
        European (payer, receiver, straddle)
        Bermudan (payer, receiver, straddle)
        Bermudan-European Switches (payer, receiver, straddle)
        LIBOR Cap/Floor, Straddle
        LIBOR Digital Cap/Floor
    Convexity Products
        Cap/Floor, Straddle (CMS/CMT 2, 5, 10, 30 year tenors)
        Rolling Spread Locks against a spot hedge
        Rolling Spread Locks quoted outright
Equity Index Products
    American and European Options
        Calls
        Puts
        Straddles

Table 1

A number of systems have been developed which attempt to automate the trading process and provide credit controls. For example, U.S. Patent No. 6,014,627 describes an anonymous trading system which identifies the best bids and offers from those counterparties with which each party is eligible to trade. The system pre-screens each bid and offer for a particular type of financial instrument for compatibility with credit information to calculate a best price (the "dealable" price), for each entity dealing with the particular financial instrument.

U.S. Patent No. 5,924,083 describes a distributed trading system for displaying a credit-filtered view of markets for financial instruments based upon credit limits entered by the trading parties. Each trading entity initially enters credit information which consists of the amount of credit that the trading entity is willing to extend to other trading entities for one or more types of trading instruments. Each trading entity may also create group credit limits by

which the trading entity may limit the amount of credit it is willing to extend to a group of potential counterparties.

PCT Application, No. PCT/US98/21518 describes a credit preference method in an anonymous trading system for screening trades between entities. Three screening methods

5   are described: a binary method in which each entity makes a yes or no determination as to whether or not it will deal with each potential counterparty; a line binary or time limit method in which each entity sets a maximum maturity of contracts for each potential counterparty; and a "complex" method in which each entity specifies a maximum amount it will trade with each counterparty for one or more "maturity bands." The system provides a "complex preference

10 interface" through which a credit administrator for the trading entity can specify for each potential counterparty, the maximum exposure for each maturity band. For example, an entity could specify that for a given counterparty, it "will do up to $100 million out for 5 years, <u>and</u> then only $50 million out from thereafter out to 10 years, and nothing thereafter." In determining appropriate limits, the administrator use a measure of "risk equivalence" (RQ)

15 which is calculated as a function of the potential exposure averaged over a series of time points, weighed by a discount factor.

Although the above systems disclose credit mechanisms for use with trading systems, no known prior art allows an administrator or other authorized user to easily relate credit limits for multiple tenors or instruments. Thus, there exists a need for a method and system of

20 facilitating the use of related credit limits for use with trading systems.

SUMMARY OF THE INVENTION

These and other limitation of the prior art are addressed in the present invention which is a system and method of tracking credit limits between counterparties trading financial

25 instruments on a trading system, where each financial instrument may have one or more tenors associated with it. Each trading party has a set of credit limits associated with each other potential trading party. This includes a credit limit for one or more tenors of each financial instrument to be traded. The tenors are grouped into sets of "buckets," where a single credit limit is applied to all tenors in an individual bucket. A relationship is associated

30 with the credit limits for a first group of buckets wherein credit extended on one of the tenors in

3

an individual bucket proportionally reduces the available credit for the other buckets, and therefore the credit limit on each tenor in the buckets. When a trade is entered into between a party and a given counterparty for a given tenor, the credit limit for the bucket associated with the tenor is reduced by the amount of the trade and the credit limits on the related buckets are

5   proportionally reduced. In a preferred embodiment, the credit limit of each bucket is reduced in proportion to an initial assigned credit limit.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic diagram of exemplary credit relationships formed between trading organizations in accordance with the present invention;

10   Figure 2 is a flow chart of a preferred process for tracking credit limits in accordance with the invention;

Figure 3 is a flow chart of a method for calculating proportional draw downs and currently available limits in accordance with the present invention;

Figure 4 shows an exemplary user interface for selecting trading groups in accordance

15   with the present invention;

Figures 5A and 5B show an exemplary user interface for specifying draw down proportions for various tenors for financial instruments in accordance with the present invention;

Figure 6 shows an exemplary user interface for setting eligibility as well as available

20   credit multipliers for a plurality of counterparties in accordance with the present invention;

Figure 7 shows an exemplary user interface for customizing proportional draw downs for individual institutions;

Figure 8 shows an exemplary user interface for globally selecting buckets of financial instruments;

25   Figure 9 shows an exemplary user interface for setting buckets for an individual institution;

Figure 10 shows an exemplary trader screen including credit relationship status information for each bid and offer; and

Figure 11 is a schematic of an exemplary computer network implementing the disclosed

30   invention.

4

DETAILED DESCRIPTION OF THE INVENTION

With reference to Figure 1, a typical trading and credit scenario is described. Trades of financial instruments are typically performed between trading groups (10, 12, 14, 16, 18, 20). Each trading group typically trades one or more types of financial instruments. Each trading

5   group also typically includes one or more individual traders. Credit relationships are typically established between trading groups and legal organizations (22, 24, 26 and 28). Alternatively, credit relationships may be formed between trading groups and parent companies of the legal organizations (shown as institutions 30, 32); or between any combination of trading groups, organizations, institutions, or other entity. Accordingly, the term "party" or "counterparty" shall

10   refer to any institution, organization, trading group, or other entity which has a unilateral or bilateral credit relationship with another entity. In a typical scenario, a credit officer or someone with policy setting power for a party will define the amount of credit the party is willing to extend to each potential counterparty.

The invention is most suited to instruments that include on-going obligations, such as

15   those listed in Table 1, but can also be applied to other instruments, such as stocks and bonds where a party's only significant risk is settlement. Moreover, the invention also applies to contracts based upon the exchange of any commodity, such as contracts for the exchange of bandwidth, real estate, electricity, processing power, freight transportation, etc. Thus the term "financial instruments" as used herein includes contracts based upon such commodities or

20   services.

With reference to Figure 2, an overview of the system for entering and processing credit limits on buckets is described. For each potential counterparty (50), the system is initialized, i.e. α is set to zero (51), and the credit officer or other authorized user (referred to herein as an "administrator" or "credit officer") defines a Proportional Draw Down limit (52) for each

25   bucket by tenor M_i^0 for buckets (i = 1...N). The administrator may combine several tenors or financial instruments into a single bucket. Thus, for example, the administrator may choose to set up three buckets for a given financial instrument, such as a two year tenor, a five year tenor and a seven year tenor. Any tenor for this financial instrument would then be assigned to one of these buckets based on its lifespan. In a preferred embodiment, any tenor of the

30   financial instrument of two years or less would be assigned to the two year bucket; any tenor

of the financial instrument of greater than two years but less than or equal to five years would be assigned to the five year bucket; and any tenor of the financial instrument of greater than five years but less than or equal to seven years would be assigned to the seven year bucket. Any tenor of the financial instrument of greater than seven years could not be traded unless

5 the administrator chose to create an additional bucket of a longer tenor. In an alternate embodiment, tenors of greater than the maximum bucket tenor are given a "maybe" trading status, as described further below. The administrator further decides how buckets are related. For example, all tenors of a given financial instrument are typically related. In addition, the administrator may also decide to group different financial instruments, such as swaps and

10 options, together, such that credit drawn down for swaps will reduce the credit available for the options.

The Proportional Draw Down for each bucket represents the amount of trading that could potentially be done (on a notional basis) in a single bucket that would completely exhaust the entire credit limit of a given counterparty. Combined, the Proportional Draw

15 Downs for a group of buckets give the proportional relationship between trades done in different buckets. In one embodiment of the invention, the administrator may further define an Overriding Credit Limit (54) for each bucket O_i^0 for buckets (i = 1...N) which is an additional constraint on credit that further limits the trading in any bucket. The Overriding Credit Limit is the maximum that may be drawn down from a given bucket. The Current Available credit limit

20 at any given time for each bucket is then the minimum of the Proportional Draw Down and the Overriding Credit Limit. In one embodiment, the administrator may further specify a minimum trade amount (CL_{min}) below which trades will be allowed. This may be a global variable or assigned individually for each entity. Optionally, this minimum is simply set to zero.

The Proportional Draw Downs create a relationship between the various buckets for the

25 various instruments, such that the trading in any instrument in any single bucket will have an effect on all of the instruments in any related buckets. While the present invention is described in terms of Proportional Draw Downs, other methods of specifying the relationship between tenors of financial instruments are within the scope of the invention and will be apparent to those of skill in the art based on the specification herein. These alternate

30 methods include, without limitation, specifying the fractional relationships between buckets.

Thus, for example, one could specify a credit relationship between ten year, five year, and two year tenors, for a given option, as 1:4; 1:2; and 1:1. Once the administrator defines the Proportional Draw Downs, and, optionally, the Overriding Credit Limits, the system calculates (55) initial Currently Available Limits for each bucket C_i^0 for buckets (i = 1...N). The initial

5   Currently Available Limits are preferably calculated according to the formula:

$$C_i^0 = \max (\min [M_i^0, O_i^0], CL_{min}).$$

As shown in Figure 2, after the Proportional Draw Down Limits and Overriding Limits are defined, and the initial Currently Available Limits are calculated, the system is ready to process trades (56). A preferred methodology utilizing the concept of Proportional Draw

10 Downs along with Overriding Limits to track Current Available Limits is now described:

Suppose there are N Buckets: 1...N.

Suppose that there have been α (α = 0, 1, 2, ...) trades done so far.

Denote the values of the Proportional Draw Downs for the N buckets after α trades as M_i^α, i = 1...N, the values of the Overriding Limits as O_i^α, i = 1...N, and the

15 values of the Current Available Limits as C_i^α, i = 1...N.

Suppose that the α + 1 trade is done (56) in the kth bucket with size X_k.

In one embodiment of the invention, both parties to a trade will draw down the credit limits available to the opposing party for any trade. In another embodiment, trades for certain types of instruments having non-symmetrical credit risks will only draw down against the credit

20 limits for one of the parties. For example, the buyer of an option would want to reduce the credit limit of the party it is buying the option from, whereas the seller of an option may not want to reduce the credit limit of the party it is selling the option to. In this embodiment, the system will determine whether to reduce one or both parties respective credit limits based on the nature of the instrument and whether the party is a buyer or a seller.

25 The system calculates (58) (for at least one counterparty) new values for the Proportional Draw Downs as:

$$M_i^{\alpha + 1} = M_i^\alpha - (M_i^\alpha / M_k^\alpha) * X_k. \quad\quad\quad (1)$$

The system calculates (60) (for at least one counterparty) new values for the Overriding Limits as:

30 $$O_i^{\alpha + 1} = O_i^\alpha - \delta_{ik} * X_k. \quad\quad\quad (2)$$

where δ_{ik} is the well known Kronecker Delta and has a value equal to 0 if i is not equal to k and a value equal to 1 if i equals k.

The system calculates (62) (for at least one counterparty) new values for the Current Available Limits as:

$$C_i^{\alpha + 1} = \max (\min [M_i^{\alpha + 1}, O_i^{\alpha + 1}], CL_{min}). \qquad (3)$$

where max is the maximum function which compares the two arguments and returns their maximum, and min is the minimum function which compares its two arguments and returns their minimum.

As noted above, in one embodiment CL_{min} is automatically set by the system to zero. This ensures that the counterparty's credit limit will never be less than zero. However, CL_{min} may be changed by an authorized user. Finally, α is incremented (63)

For the case of a typical trading desk authorized to trade swaps and options the following examples will help to understand the invention. Assume the trading desk's credit officer has specified the values for Proportional Draw Downs and Overriding Limits as shown in the first two rows of Table 2 and Table 3 below.

Initially no trades have taken place (i.e. $\alpha = 0$).

SWAPS	2 Year ("bucket 1")	5 Year ("bucket 2")	10 Year ("bucket 3")
Proportional Draw Down ($MM)	400	200	100
Overriding Limit ($MM)	300	100	80
Current Available Limit ($MM)	300	100	80

Table 2

OPTIONS	2 Year ("bucket 4")	5 Year ("bucket 5")	10 Year ("bucket 6")
Proportional Draw Down ($MM)	800	400	200
Overriding Limit ($MM)	500	400	200
Current Available Limit ($MM)	500	400	200

Table 3

If we let the two year bucket for Swaps be bucket 1; the five year bucket for Swaps be bucket 2; the 10 year bucket for Swaps be bucket 3; the two year bucket for Options be bucket 4; the five year bucket for Options be bucket 5; and the ten year bucket for Options be bucket 6; the values for Proportional Draw Downs, Overriding Limits, and Current Available Limits are as follows:

$$M_1^0 = 400, M_2^0 = 200, M_3^0 = 100, M_4^0 = 800, M_5^0 = 400, M_4^0 = 200;$$

$$O_1^0 = 300, O_2^0 = 100, O_3^0 = 80, O_4^0 = 500, O_5^0 = 400, O_4^0 = 200;$$

$$C_1^0 = 300, C_2^0 = 100, C_3^0 = 80, C_4^0 = 500, C_5^0 = 400, C_4^0 = 200.$$

Now assume a trade takes place consisting of $40 MM of 2 year Swaps. The value for the trade size is:

$$X_1 = 40.$$

The new values (i.e. the $\alpha + 1$ values) for the Proportional Draw Downs, Overriding Limits, and Current Available Limits can then be calculated using equations (1), (2), and (3) respectively.

For example:

$$M_1^1 = 400 - (400/400) * 40 = 360;$$

$$O_1^1 = 300 - 1 * 40 = 260;$$

$$C_1^1 = max(min(360,260),0) = 260.$$

Tables 2 and 3 can then be updated with the new values as shown in Tables 4 and 5, respectively.

SWAPS	2 Year	5 Year	10 Year
Proportional Draw Down ($MM)	360	180	90
Overriding Limit ($MM)	260	100	80
Current Available Limit ($MM)	260	100	80

Table 4

OPTIONS	2 Year	5 Year	10 Year
Proportional Draw Down ($MM)	720	360	180
Overriding Limit ($MM)	500	400	200
Current Available Limit ($MM)	500	360	180

Table 5

In a more general embodiment of the invention, Overriding Limits are not required. In essence, this is a special case of the above methodology in that it is equivalent to setting the Overriding Limit to the Proportional Draw Down for each bucket. The mathematical model for

5   this case is as follows:

Suppose there are N Buckets: 1…N.

Suppose that there have been α (α = 0, 1, 2, …) trades done so far.

Denote the values of the Proportional Draw Downs for the N buckets as M_i, i = 1…N.

10   Denote the values of the Current Available Limits after α trades as C_i^α, i = 1…N.

Suppose that the α + 1 trade is done in the kth bucket with size X_k.

The new values for the Current Available Limits are

$$C_i^{\alpha + 1} = \max [C_i^\alpha - (M_i / M_k) * X_k, , CL_{min}]. \tag{4}$$

Equation (4) can be employed in a similar manner to equation (3) above to continually

15   track available credit. As above, in one embodiment CL_{min} is automatically set to zero, but may, alternatively, be administrated as noted above.

In one embodiment of the invention, the system implements the above procedure by normalizing the credit limits in buckets 1…N to the credit limit for a single bucket, called a Normalized Total Credit (NTC). The buckets are typically normalized to the maximum tenor,

20   for example, the swaps of Table 2 above would be normalized to $100 million ten year swaps.

Thus, for example the conversion ratios (CR_i) for the two, five, and ten year swaps of Table 2 could be expressed as: .25, .5, and 1, respectively, where NTC is the normalized total credit ($100 million) with respect to the ten year swap.

With reference to Figure 3, a preferred method for calculating credit limits using NTC is

25   now discussed. Once the Proportional Draw Downs and Overriding Credit Limits have been entered, the NTC must be set (70). As noted above, this is typically set equal to the Proportional Draw Down of the maximum tenor for at least one instrument, but may be set equal to any draw down limit or any arbitrary value. The conversion ratios (CR_i) are then calculated (72) for each bucket as the ratio of the NTC over credit limit for that bucket. When

a signal indicating the α +1 trade has occurred for a tenor falling in the kth bucket for amount X_k, is being entered into is received (74), the system recalculates (76) the NTC as:

$$NTC^{\alpha+1} = NTC^{\alpha} - (X_k * CR_i).$$

Proportional Draw Downs for each bucket (M_i) are calculated (78) as:

$$M_i^{\alpha+1} = NTC^{\alpha+1} * 1 / CR_i.$$

Overriding Credit Limits (O_i) are calculated (80) as:

$$O_i^{\alpha+1} = O_i^{\alpha-1} - \delta_{ik} * X_k.$$

Current Available Limits (C_i^{α}) are calculated (82) as:

$$C_i^{\alpha+1} = \max (\min [M_i^{\alpha+1}, O_i^{\alpha+1}], CL_{min}).$$

Continuing the example from Table 2 and 3 above, Tables 6 and 7 show initial Proportional Draw Downs of 400, 200, and 100 million, and Overriding Credit Limits of 300, 100, and 80 million for 2, 5 and 10 year swaps; and Proportional Draw Downs of 800, 400, and 200 million and Overriding Credit Limits of 500, 400, and 200 for 2, 5, and 10 year options, respectively.

SWAPS	2 Year	5 Year	10 Year
Proportional Draw Down ($MM)	400	200	100
Conversion Ratio	CR: .25	CR: .5	CR: 1
Overriding Limit ($MM)	300	100	80
Current Available Limit ($MM)	300	100	80

Table 6

OPTIONS	2 Year	5 Year	10 Year
Proportional Draw Down ($MM)	800	400	200
Conversion Ratio	CR: .125	CR: .25	CR: .5

11

Overriding Credit Limit ($MM)	500	400	200
Current Available Limit ($MM)	500	400	200

Table 7

5   Assume forty million dollars of two year swaps, sixty-five million dollars of ten year swaps, as well as eighty million dollars of two year options are traded. NTC is calculated as follows:

$$NTC = 100 - (40 \times .25) - (65 \times 1) - (80 \times .125) = 15.$$

10   The new available limits, as shown in Tables 8 and 9 are calculated being 30 for the five year swaps or 2 times the ten year NTC, 60 for the two year swap or 4 times the ten year NTC, and the new values for the options are 2 times the ten year NTC or 30 for the ten year options, the five year options maximum is 60 or 4 times the ten year NTC, and the new two year options limit is 8 times the ten year NTC or 120. Had any of the overriding credit limits 15 been less than the calculated available limits, those values would have been used. Also, tables 8 and 9 have been updated to reflect updated Overriding Credit Limits.

SWAPS	2 Year	5 Year	10 Year
Proportional Draw Down ($MM)	60	30	15
Overriding Credit Limit ($MM)	260	100	15
Current Available Limit ($MM)	60	30	15

Table 8

OPTIONS	2 Year	5 Year	10 Year
Proportional Draw Down ($MM)	120	60	30
Overriding Credit Limit ($MM)	420	400	200
Current Available Limit ($MM)	120	60	30

Table 9

With reference to Figures 4 - 9, a preferred interface for managing credit limits will now be described. The credit officer, administrator, or other authorized user selects from a list of trading groups (shown as 112, 114, 116, 118, 120, 122, 124 and 126). The credit officer will select one or more of these trading groups and set trading properties for the selected group or

5   groups. The credit officer enters the properties screen by selecting the properties link (128). Overriding Credit Limits may be specified using a similar interface (not shown) for embodiments including overriding credit limits.

Figure 5A shows a draw down proportion screen (tab 150), including a draw down matrix (128), having three instruments, swaps (130), swaptions (132) and cap/floors (134).

10 Additional instruments traded by the specific trading group, in this example, the USD Swaps and Options group, may be available by scrolling down the screen (not shown). In this example, four buckets for each instrument are displayed, two year (140), five year (142), seven year (144) and ten year (146). As noted above, each tenor for any listed instrument will be assigned by the system to one of the buckets for that instrument. The credit officer will

15 enter the Proportional Draw Downs for each bucket for each instrument. For example, in Figure 5A, the officer has entered 1600 for two year swaps, 1000 for five year swaps, etc. As shown in Figures 8 and 9, the credit officer can redefine the number, and tenor, of buckets, either globally (Figure 8) or on an individual trading group (Figure 9) basis.

As shown by the horizontal and vertical "=" symbols in the draw down matrix (128), the

20 Proportional Draw Downs for each tenor (140, 142, 144 and 146) of the instruments (130, 132 and 134) will be related. Thus, 500 in ten year swaps will be equivalent in draw down of credit to 1500 in two year cap/floors. As shown in Figure 5B, in one embodiment, the credit administrator may specify that certain instruments and/or tenors are not related, by turning off the horizontal and/or vertical "=" symbols. For example, in Figure 5B, the credit administrator

25 has created two sets of buckets, one for USD swaps and USD swaptions, and a second for USD Cap/Floor. Thus, trading in the USD Cap/Floor instruments will not effect credit levels in the USD swaps and USD swaptions set of buckets. Likewise, trading in USD swaps or USD swaptions will not effect the credit levels in the USD Cap/Floor buckets.

Any instrument with a tenor not falling within a specific bucket will preferably be

30 automatically grouped to the next higher bucket. Thus, for the example shown in Figure 5A,

trading a six year swap will be the same as trading a seven year swap for credit purposes. In another embodiment, any instrument with a tenor not falling within a bucket will be allocated among the next higher and next lower buckets by mathematical interpolation. For the example shown in Figure 5A, a trade in a six year swap in this embodiment may have one half of its

5   notational size drawn down from the five year bucket and one half drawn down to the seven year bucket.

Figure 6 shows an eligibility screen (tab 152), including an eligibility matrix (160), having a list of eligible entities (162), a binary eligibility list (164) and a draw down multiple (166). A trading group profile specifies which entities will be included in the eligible institution list (162).

10   The first time the credit officer accesses the eligibility screen (tab 152), eligibility is defaulted to yes for all entities in the eligible institution list and the multiplier (166) is defaulted to 1.0. Any entities not included in the list will be assumed to be eligible, although their multiplier will be set to zero. Thus, as described below, new institutions will be given "maybe" status until the administrator further specifies credit status for that institution. The credit officer may modify

15   eligibility for any specific institution by clicking on the binary eligibility list (164). The draw down multiple list allows the credit officer to easily multiply the drawn down matrix (128) set above in Figure 5A by a multiplication factor. For example, Morgan Guarantee Trust has been assigned a multiple of 2.0 in Figure 6. The system would then multiply each entry in the draw down matrix (128) of Figure 5A by a factor of 2.0. For example, the two, five, seven and ten

20   year limits for USD Swaps for Morgan Guarantee Trust would be set to 3200, 2000, 1600 and 1000 for two, five, seven and ten year buckets, respectively.

Figure 7 shows a customization screen (tab 154), including a customizable draw down matrix (170) and an available credit limit matrix (172) for each trading institution. The credit officer may individually set the draw down limits for each bucket and instrument for each

25   trading institution. The screen allows the credit officer to scroll down to additional trading entities. Users without credit setting power may view this screen to see the available credit limits for each institution, but preferably, are not allowed to modify credit limits.

As shown in Figure 10, credit relationships in accordance with the present invention may be displayed on trader screens such that the credit relationship for individual trades may

30   be displayed while keeping the identity of the potential trading counterparty anonymous. In a

preferred embodiment, individual bids and offers are displayed with an indication, preferably specific colors, corresponding to the potential credit relationship of the counterparty. Bids and offers on which credit is bilaterally approved according to the credit relationship scheme are indicated by a first color, preferably green (shown as standard font text in Figure 10). Bids and

5   offers having a "maybe" status as to credit are indicated by a second color, preferably yellow (shown as underlined text in Figure 10). A bid or offer will have a "maybe" status when credit was initially assigned by either party to the potential counterparty but has been used up, at least for the specific tenor, through one or more trades. These are considered "maybe" in the preferred embodiment because credit officers typically spread credit over a variety of systems

10   and are often willing to further extend credit on one or more systems to a specific counterparty, particularly when the credit for the given counterparty has been used up on one system but not another. Alternately, "maybe" status for a potential counterparty would arise where the initial proportional draw downs or overriding credit limits have been set to zero. Bids and offers in which one or both parties have a "no" status are indicated with a third color,

15   preferably red (shown as bold/italic in Figure 10). This occurs when the credit officer for either party indicates they will not trade with the entity associated with the bid and/or offer. Traders using this system will immediately know the credit status, "yes," "no," or "maybe," of any bid or offer on the system before attempting to enter into a trade.

The system is preferably implemented utilizing a computer network as disclosed in

20   Figure 11. Each trader station (250, 251 and 252) is connected to the server (254) through the network (255). The network (255) is preferably a private network connected through any number of means, such as T1 lines, digital subscriber lines, cable modems, satellite links, or other available connection means. One or more trader stations for a trade group may be coupled via a local area network (253). A credit officer station (256) also is preferably coupled

25   via the same local area network (253) to server (254). Alternatively, trader stations (250, 251 and 252) may be coupled to server (254) through any of a number of means, such as via a public network such as the Internet or via a virtual private network. The system preferably utilizes a client-server architecture in which trader stations (250, 251 and 252) execute a thin-client written in Java to communicate with the server (254). In an alternate embodiment, the

30   server (254) acts as a web server and communicates with trader stations (250, 251 and 252)

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using a page description language, such as HTML. In this embodiment, traders interact with server (254) using an HTML compatible browser (e.g., Netscape Navigator® or Microsoft Internet Explorer®).

5   Although the present invention was discussed in terms of certain preferred embodiments, the description is not limited to such embodiments. Rather, the invention includes other embodiments including those apparent to a person of ordinary skill in the art. Thus, the scope of the invention should not be limited by the preceding description but should be ascertained by reference to claims that follow.

10

What is claimed is:

1. A method, with the aid of a computer system, of tracking credit limits for a plurality of tenors of one or more financial instruments, comprising:

   defining a plurality of buckets, each said tenor associated with at least one said bucket;

   assigning proportional draw down relationship between said buckets;

   receiving a signal associated with a trade action, said signal including a trade tenor and a trade amount; and

   recalculating said proportional draw down relationships as a function of said trade amount and said trade tenor.

2. The method of claim 1 further comprising:

   defining an overriding credit limit for each said bucket.

3. The method of claim 2 further comprising:

   recalculating said overriding credit limit for each bucket as a function of said trade amount and said trade tenor.

4. The method of claim 3 further comprising:

   calculating a current available limit for each bucket.

5. The method of claim 3 further comprising:

   defining an initial proportional draw down (M_i^0) for each of $i = 1...N$ buckets;

   said recalculation of said proportional draw down relationship comprising:

   implementing a function expressed as

   $$M_i^{\alpha + 1} = M_i^\alpha - (M_i^\alpha / M_k^\alpha) * X_k,$$

   where $M_i^{\alpha+1}$ denotes the value of the proportional draw down for bucket i after $\alpha +1$ trades, and X_k denotes the size of the trade for bucket k.

6. The method of claim 5 wherein said recalculation of said overriding limits comprises:

   implementing a function expressed as

   $$O_i^{\alpha + 1} = O_i^\alpha - \delta_{ik} * X_k,$$

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where $O_i^{\alpha+1}$ denotes the value of the overriding limit for bucket i after $\alpha + 1$ trades, and δ_{ik} is the Kronecker Delta function and has a value equal to 0 if i is not equal to k and a value equal to 1 if i equals k.

7. The method of claim 6 further comprising:

defining an initial proportional draw down (M_i^0) for each of i = 1...N buckets;

said calculation of said current available limits comprising:

implementing a function expressed as

$$C_i^{\alpha+1} = \max (\min [M_i^\alpha + 1, O_i^{\alpha+1}], CL_{min}),$$

where $C_i^{\alpha+1}$ is the current available limit for bucket i after $\alpha + 1$ trades, CL_{min} is a minimum trade amount below which trades will be allowed and max is the maximum function and min is the minimum function.

8. The method of claim 6 wherein CL_{min} is zero.

9. The method of claim 1 further comprising:

calculating a current available limit for each bucket.

10. The method of claim 9 further comprising:

defining an initial proportional draw down (M_i^0) for each of i = 1...N buckets;

said recalculation of said proportional draw down comprising:

implementing a function expressed as

$$M_i^{\alpha + 1} = M_i^\alpha - (M_i^\alpha / M_k^\alpha) * X_k,$$

where $M_i^{\alpha + 1}$ denotes the value of the proportional draw down for bucket i after $\alpha + 1$ trades, and X_k denotes the size of the trade for bucket k;

said calculation of said current available limit comprising:

implementing a function expressed as

$$C_i^{\alpha + 1} = \max [C_i^\alpha - (M_i / M_k) * X_k, , CL_{min}]$$

where $C_i^{\alpha} + 1$ is the current available limit for bucket i after $\alpha + 1$ trades, CL_{min} is a minimum trade amount below which trades will be allowed and max is the maximum function and min is the minimum function.

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11.   The method of claim 9 further comprising:

determining whether said trade amount associated with said trade signal is greater than said current available limit for said bucket associated with said trade tenor, said trade associated with said trade signal is not allowed if said trade amount is greater than said current available limit for said bucket associated with said trade tenor.

12.   The method of claim 11 further comprising:

displaying an indication if said trade amount is greater than said current available limit.

13.   The method of claim 1 further comprising:

setting a normalized credit limit (NTC);

calculating a conversion ratio CR_i to said NTC for each said bucket (i);

recalculating NTC according to the function

$$NTC^{\alpha+1} = NTC^{\alpha} - (X_k * CR_i),$$

where $NTC^{\alpha+1}$ is the NTC value after $\alpha + 1$ trades, X_k is the size of the $\alpha + 1$ trade and CR_i is the conversion ratio for bucket i;

defining an initial proportional draw down (M_i^0) for each of i = 1...N buckets; and

said recalculating said proportional draw down relationships in response to said trade signal being performed according to the function

$$M_i^{\alpha+1} = NTC^{\alpha+1} * 1/CR_i$$

where $M_i^{\alpha+1}$ denotes the value of the proportional draw down for bucket i after $\alpha + 1$ trades.

14.   The method of claim 1 wherein said credit limits are tracked for a plurality of parties, said method further comprising:

identifying, for each party, a set of counterparties said party may potentially trade with, each said counterparty having at least one plurality of buckets associated with it.

15.   The method of claim 14 wherein at least one party identifies a counterparty having at least a first plurality of buckets and a second plurality of buckets associated with said counterparty, said party assigning a first proportional draw down relationship between said first plurality of buckets, said party further assigning a second proportional draw down relationship between said second plurality of buckets.

16. The method of claim 15 in which said first proportional draw down relationship is unrelated to said second draw down relationship.

17. The method of claim 14 in which at least one said party has a plurality of trading groups associated with it.

5   18. The method of claim 17 in which at least one said trading group has a set of counterparties associated with said trading group.

19. The method of claim 1 wherein said financial instruments are selected from the group consisting of stocks; contracts based on the exchange of commodities, bonds, and derivative instruments.

10   20. The method of claim 1 wherein said financial instruments are selected from the group consisting of foreign exchange products, fixed income products, and equity products.

21. The method of claim 19 wherein said derivative instruments are selected from the group consisting of American options, European options, exotic options, forwards, swaps, forward rate agreements, swaptions, and convexity products.

15   22. The method of claim 7 wherein CL_{min} is assigned globally to a plurality of potential counterparties.

23. The method of claim 7 wherein CL_{min} is assigned individually to each of a plurality of potential counterparties.

24. The method of claim 1 wherein

said signal further includes an identification of a financial instrument, a buyer and

20   a seller;

said assigning a proportional draw down relationship between said buckets including associating a first proportional draw down relationship for credit extended by said buyer to said seller, said first proportional draw down relationship associated with a

25   first set of said buckets, and associating a second proportional draw down relationship for credit extended by said seller to said buyer, said second proportional draw down relationship associated with a second set of said buckets;

said method further comprising:

determining whether to recalculate said first proportional draw down

30   relationship based on the type of financial instrument; and

determining whether to recalculate said second proportional draw down

relationship based on the type of financial instrument,

wherein trades for certain types of financial instruments will only effect said first

or second proportional draw down relationships based on the type of instrument and

5   whether the party is a buyer or seller.

25.   The method of claim 24 wherein each said bucket is associated with a current

available credit limit, said method further comprising:

if said first proportional draw down relationship is recalculated,

recalculating said current available credit limit for each said bucket in said first

10   set of buckets; and

if said second proportional draw down relationship is recalculated,

recalculating said current available credit limit for each said bucket in said

second set of buckets.

26.   The method of claim 25 wherein each said bucket is associated with an

15 overriding credit limit, said method further comprising:

if said first proportional draw down relationship is recalculated,

recalculating said overriding credit limit for each said bucket in said first set of

buckets; and

if said second proportional draw down relationship is recalculated,

20   recalculating said overriding credit limit for each said bucket in said second set of

buckets.

27.   The method of claim 1 wherein said buckets are identified with a bucket tenor,

each said trade being associated with a bucket having a bucket tenor greater than or equal to

said trade tenor.

25   28.   The method of claim 1 wherein said buckets are identified with a bucket tenor,

each said trade being associated with a first bucket and a second bucket based on

interpolation.

29.   A method of trading of financial instruments between institutions comprising:

identifying a plurality institutions to trade with;

30   identifying a plurality of buckets;

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identifying a set of financial instruments to be traded, each said financial instrument having at least one tenor, each said tenor associated one said bucket;

setting an initial available credit limit for each said bucket, said available credit limit for each of said bucket is normalized by assigning a relationship to said available

5 credit limits, wherein credit extended on one of said tenors reduces said available credit in said associated bucket and further reduces said available credit for said other buckets in said plurality of buckets, said available credit being reduced in proportion to said initial assigned credit limits;

trading said securities; and

10 recalculating and normalizing said available credit limits with each trade.

30. A system for tracking credit limits among a plurality of trading entities trading a plurality of tenors of one or more financial instruments, comprising:

a database, said database storing:

a plurality of buckets, each bucket associated with a range of
15 tenors of said one or more financial instruments;

for at least one said trading entity, proportional draw down relationships between said buckets, said proportional draw down associated with at least one other trading entity;

for said at least one trading entity, a current available limit for each
20 said bucket associated with each said other trading entity; and

an interface adapted to receive a signal from a trading system, said signal associated with a trade action, said signal including a first party, a second party, a trade financial instrument, a trade tenor and a trade amount;

a server coupled to said interface and said database, said server adapted to:

25 in response to receiving said trade signal, recalculate said proportional draw down relationship between said first party and said second party as a function of said trade amount and said trade tenor; and

calculate a current available limit between said first party and said second for each said trade bucket associated with said trade financial
30 instrument.

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31.   The system of claim 30 further comprising:

a display associated with a trading entity, said display including a plurality of bids and offers, each bid and offer associated with a potential counterparty, a financial instrument and a tenor,

5   said display further indicating the credit status between said trading entity and said potential counterparty for each said bid and offer.

32.   The system of claim 30 wherein said server is further adapted to receive signals associated with bids and offers, each bid and offer associated with a potential counterparty, a financial instrument and a tenor, said server generating a signal indicating the credit status

10   between said trading entity and said potential counterparty for each said bid and offer.

33.   A method, with the aid of a computer system, of tracking credit limits for a plurality of tenors of one or more financial instruments, comprising:

defining a plurality of buckets, each said tenor associated with at least one said bucket;

15   assigning proportional draw down relationships between said buckets;

calculating an initial overriding credit limit for each said bucket;

receiving a signal associated with a trade action, said signal including a trade tenor and a trade amount; and

recalculating said overriding credit limit for each said bucket as a function of said

20   trade amount and said trade tenor.

ICOR-002

ABSTRACT

A method for tracking credit limits between a first financial institution and a second financial institution is disclosed. Each financial instrument may have one or more tenors. An initial credit limit is assigned to a credited financial institution for each tenor of each financial instrument to be traded. A relationship is assigned to each credit limits on a first plurality of tenors wherein credit extended on one of said tenors reduces the available credit on said other tenors, said credit being reduced in proportion to said preassigned proportions. When the system receives a signal associated with trades between counterparties, the system updates the credit limits between the counterparties in accordance with preassigned proportions.

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FIGURE 1

FIGURE 2

Select Counterparty — 50

Initialize ∞
$\infty = 0$ — 51

Define Proportional Draw Down Limits (M_i^0)
For Each Bucket (1...N) — 52

Define Overriding Limits (O_i^0)
For Each Bucket (1...N) — 54

Calculate Current Available Limits (C_i^0)
for Each Bucket (1...N)
$$C_i^{\;0} = max \; (min \; (M_i^{\;0}, O_i^{\;0}), \; CL_{mn})$$ — 55

Additional Counterparties — Yes / No

Wait Trade
$\infty + 1$ *trade in Kth bucket with size* X_k — 56

Calculate Proportional Draw Downs
For Each Bucket
$$M_i^{\;\infty+1} = M_i^{\;\infty} - \left(M_i^{\;\infty} / M_k^{\;\infty}\right) * X_k$$ — 58

Calculate Overriding Limits For Each Bucket
$$O_i^{\;\infty+1} = O_i^{\;\infty} - \delta_{ik} * X_k$$ — 60

Calculate Current Available Limits For Each Bucket
$$C_i^{\;\infty+1} = max \; (min \; [M_i^{\;\infty+1}, O_i^{\;\infty+1}], CL_{min})$$ — 62

Increment ∞
$\infty = \infty + 1$ — 63

FIGURE 3

```
┌─────────────────────────────────────────┐
│        Set Normalized Credit (NTC)       │  70
└─────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────┐
│      Calculate Conversion_Ratios (CR_i)  │  72
└─────────────────────────────────────────┘
                     │
                     ▼
```

$$\text{Wait Trade}$$

$$\propto +1\ trade\ in\ bucket\ k\ with\ size\ X_k$$ 74

Recalculate NTC

$$NTC^{\propto +1} = NTC^{\propto} - (X_k * CR_k)$$ 76

Recalculate Proportional Draw Downs

$$M_i^{\propto +1} = NTC^{\propto +1} * 1/CR_i$$ 78

Calculate Overriding Limits

$$O_i^{\propto +1} = O_i^{\propto} - \delta_{ik} X_k$$ 80

Calculate Current Available Limits

$$C_i^{\propto +1} = \max(\min[M_i^{\propto +1}, O_i^{\propto +1}], CR_{\min})$$ 82

Increment $\propto$

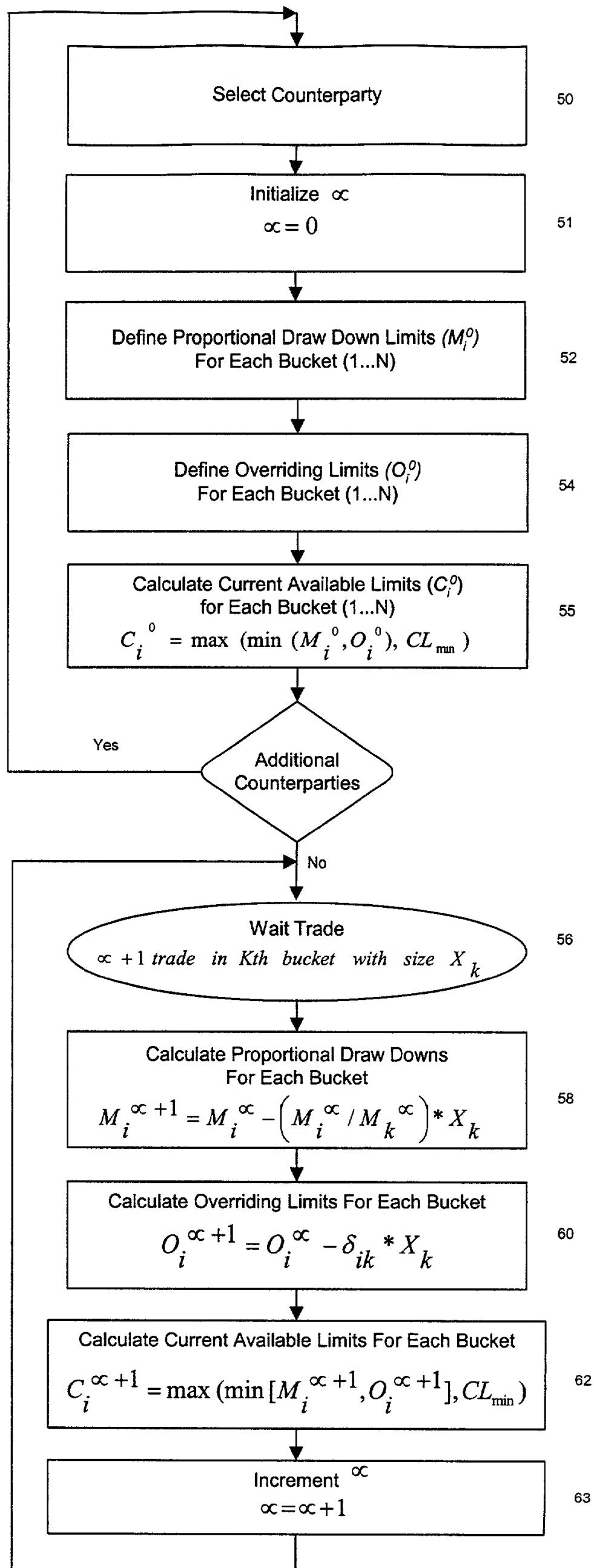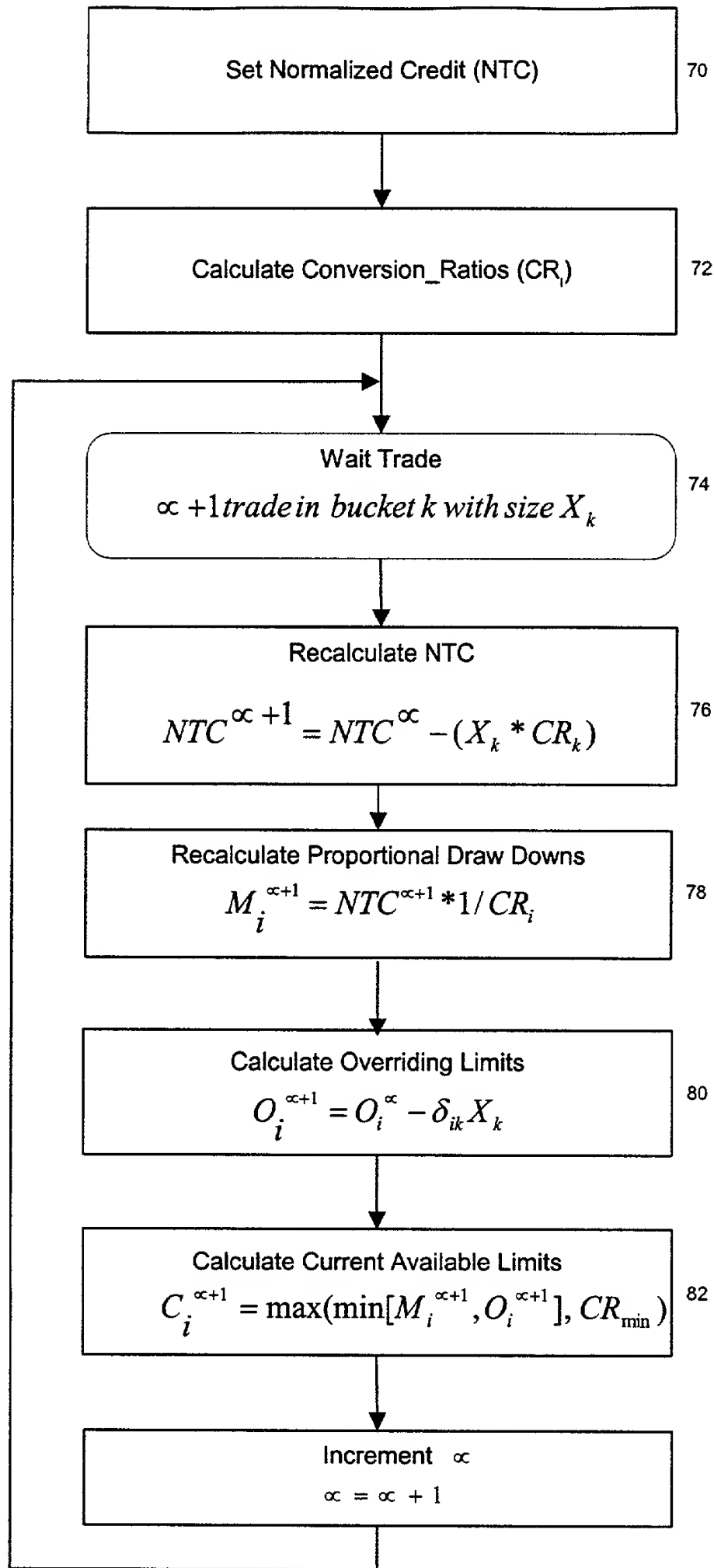$$\propto\ =\ \propto\ +\ 1$$

Druid Credit Management -- LOGIN NAME

Trading Groups Managed by LOGIN NAME:

- ⊕ JPY Swaps and Options Group [112]

- ⊕ GFX Group [114]

- ⊕ European Swaps Group [116]

- ⊕ Complex Options Group [118]

- ⊕ USD Swaps and Options Group [120]

- ⊕ Exotic FX Options Group [122]

- ⊕ US Equity Index Options Group [124]

- ⊕ Asian Equity Index Options Group [126]

Properties [128]   OK   Cancel

FIGURE 4

150

152   154

Draw-Down | Eligibility | Customize |

Common Settings

Re-apply Previous Settings for all Entities

Create Same Buckets for all Entities

Please specify the Draw-Down Proportions:

128

	2Yr	5Yr	7Yr	10Yr
	140	142	144	146
USD Swap 130	1600 =	1000 =	800 =	500
USD Swaption 132	1200 =	900 =	700 =	350
USD Cap/Floor 134	1500 =	800 =	400 =	200

OK   Cancel

FIGURE 5A

Druid USD Swaps and Options Properties

Draw-Down | Eligibility | Customize |
150   152

Common Settings
154

Re-apply Previous Settings for all Entities   Create Same Buckets for all Entities

Please specify the Draw-Down Proportions:

		2Yr		5Yr				
	140			144				146
USD Swap		160C	=	100C	=	800	=	500
130								
USD Swaption		120C	=	900	=	700	=	350
132								
USD Cap/Floor		150C	=	800	=	400	=	200
134								

OK   Cancel

FIGURE 5B

Druid USD Swaps and Options Properties

Draud USD Swaps and Options Properties

Tabs: Draw-Down (150) | Eligibility (152) | Customize (154)

Legal Entity (162)	Eligibility (164)		Available Credit (MM) (multiples Draw-Down Proportions) (166)
	Yes	No	
Merrill Lynch Capital Services	● Yes	○ No	1.0
Morgan Guarantee Trust	● Yes	○ No	2.0
Morgan Stanley Capital Services	○ yes	● No	
Salomon Brothers Holding Co.	● Yes	○ No	1.5
Goldman Sachs Capital Markets	● Yes	○ No	2.3
Bank of America	● Yes	○ No	1.5
Salomon Brothers Holding Co.	● Yes	○ No	2.3
Lehman Brothers Special Financing	● Yes	○ No	1.5
National Westminster Bank	● Yes	○ No	2.3
BNP Paribas	○ yes	● No	
ABN-Amro NV	● Yes	○ No	2.3
Deutsche Bank	● Yes	○ No	1.5
Bank of New York	● Yes	○ No	2.3
Merrill Lynch Capital Services	● Yes	○ No	2.3

160

OK   Cancel

FIGURE 6

Druid USD Swaps and Options Properties

Draw-Down | Eligibility | Customize | [154]

Use this Tab only to:
1. View credit settings
2. Or, Customize credit settings

Legal Entities:

Merrill Lynch Capital Services

Proportional Draw-Downs: [170]

	2Yr.	3Yr.	5Yr.	10Yr.
USD Swaps	160C	1000	800	500
USD Swaptions	120C	900	700	350
USD Cap/Floor	150C	800	400	200

Available Credit (MM): [172]

	2Yr.	5Yr.	7Yr.	10Yr.
USD Swaps	160C	1000	800	500
USD Swaption	120C	900	700	350
USD Cap/Floor	150C	800	400	200

Customize Buckets

OK   Cancel

FIGURE 7

FIGURE 8

Druid Create Buckets

These Buckets are created for all Entities and override all current buckets

Tenor: 2Yr   3Yr   4Yr   5Yr   6Yr   7Yr   40Yr
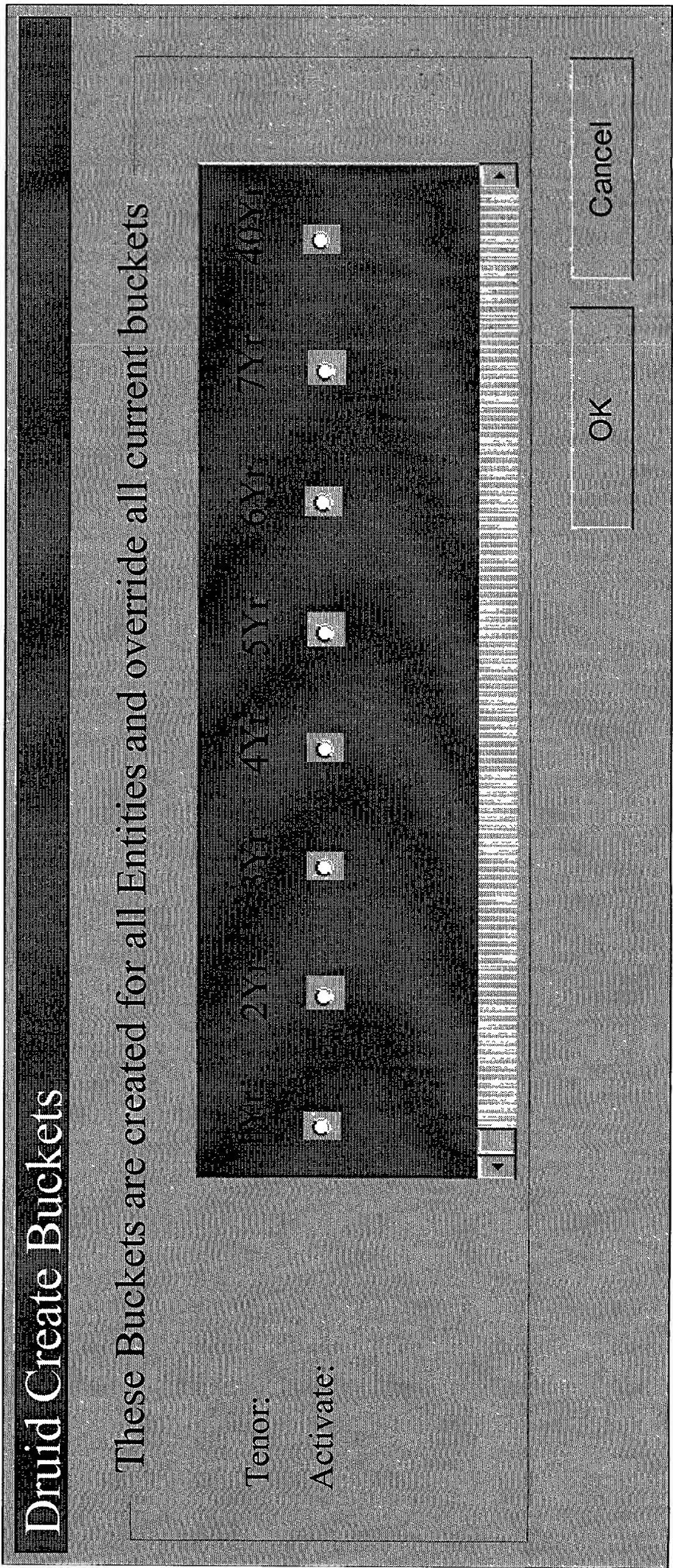
Activate:

OK   Cancel

FIGURE 9

Druid Merrill Lynch Capital Services Buckets

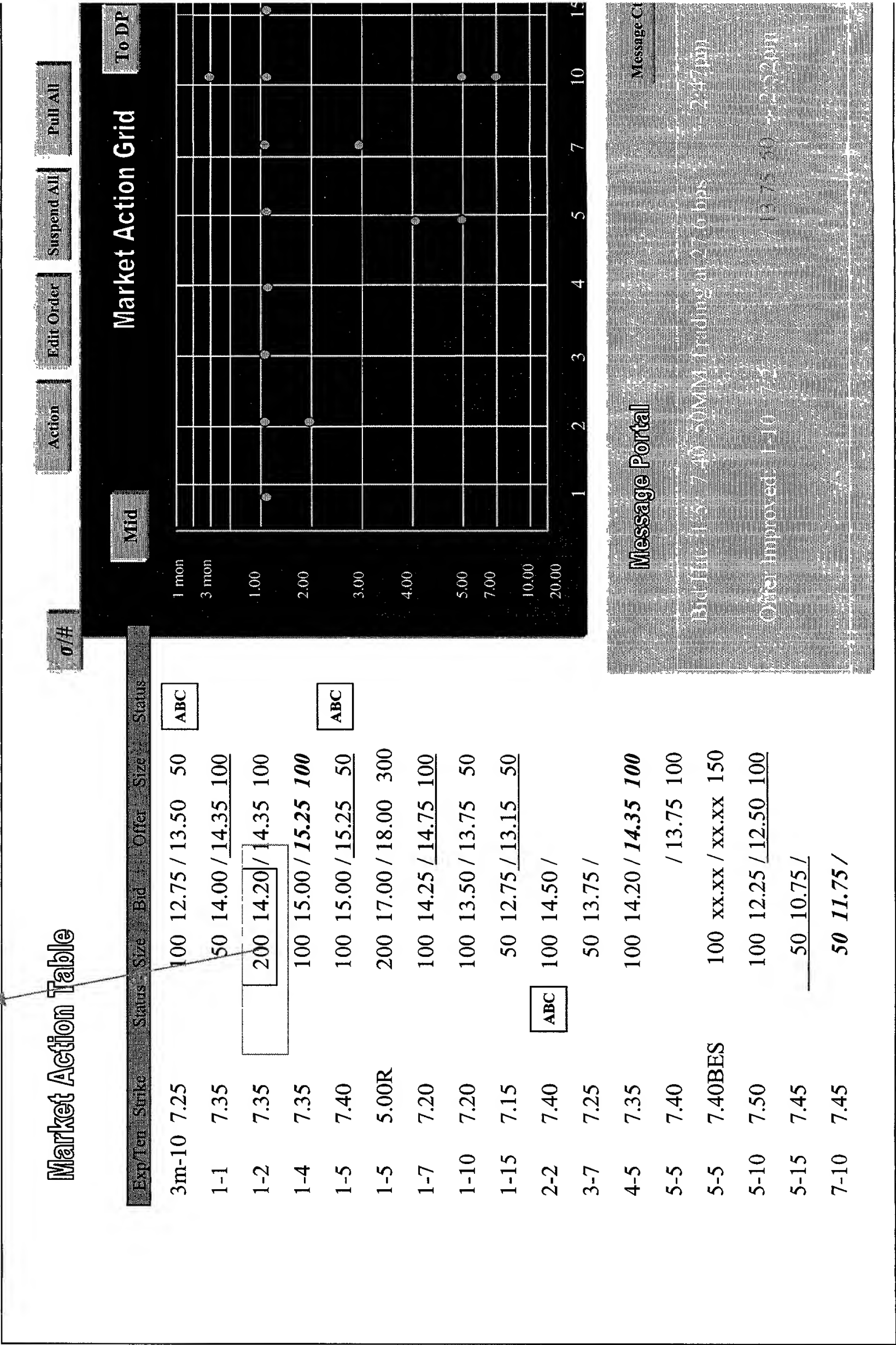These Buckets are created for Merrill Lynch Capital Services and override the current buckets.

Tenor: 1Yr   2Yr   3Yr   4Yr   40Yr

Activate:

OK   Cancel

FIGURE 10

Traders own orders in reverse video

Market Action Grid

Mid | Action | Edit Order | Suspend All | Pull All | To DP

0/#

1 mon							
3 mon							
1.00							
2.00							
3.00							
4.00							
5.00							
7.00							
10.00							
20.00							
	1	2	3	4	5	7	10

Market Action Table

Exp/Ten	Strike	Status	Size	Bid	Offer	Size	Status
3m-10	7.25		100	12.75 /	13.50	50	ABC
1-1	7.35		50	14.00 /	14.35	100	
1-2	7.35		200	14.20 /	14.35	100	
1-4	7.35		100	15.00 /	15.25	100	
1-5	7.40		100	15.00 /	15.25	50	ABC
1-5	5.00R		200	17.00 /	18.00	300	
1-7	7.20		100	14.25 /	14.75	100	
1-10	7.20		100	13.50 /	13.75	50	
1-15	7.15		50	12.75 /	13.15	50	
2-2	7.40	ABC	100	14.50 /			
3-7	7.25		50	13.75 /			
4-5	7.35		100	14.20 /	14.35	100	
5-5	7.40			/	13.75	100	
5-5	7.40BES		100	xx.xx /	xx.xx	150	
5-10	7.50		100	12.25 /	12.50	100	
5-15	7.45		50	10.75 /			
7-10	7.45		50	11.75 /			

Message Portal

Message Ct

Buffff: 1-5 : 7.40 50MM Trading at 27 obps   2:47 pm

(13.75 30)=2:52 pm

Offer improved: 1-10 13.75

server 254

Credit Officer 256

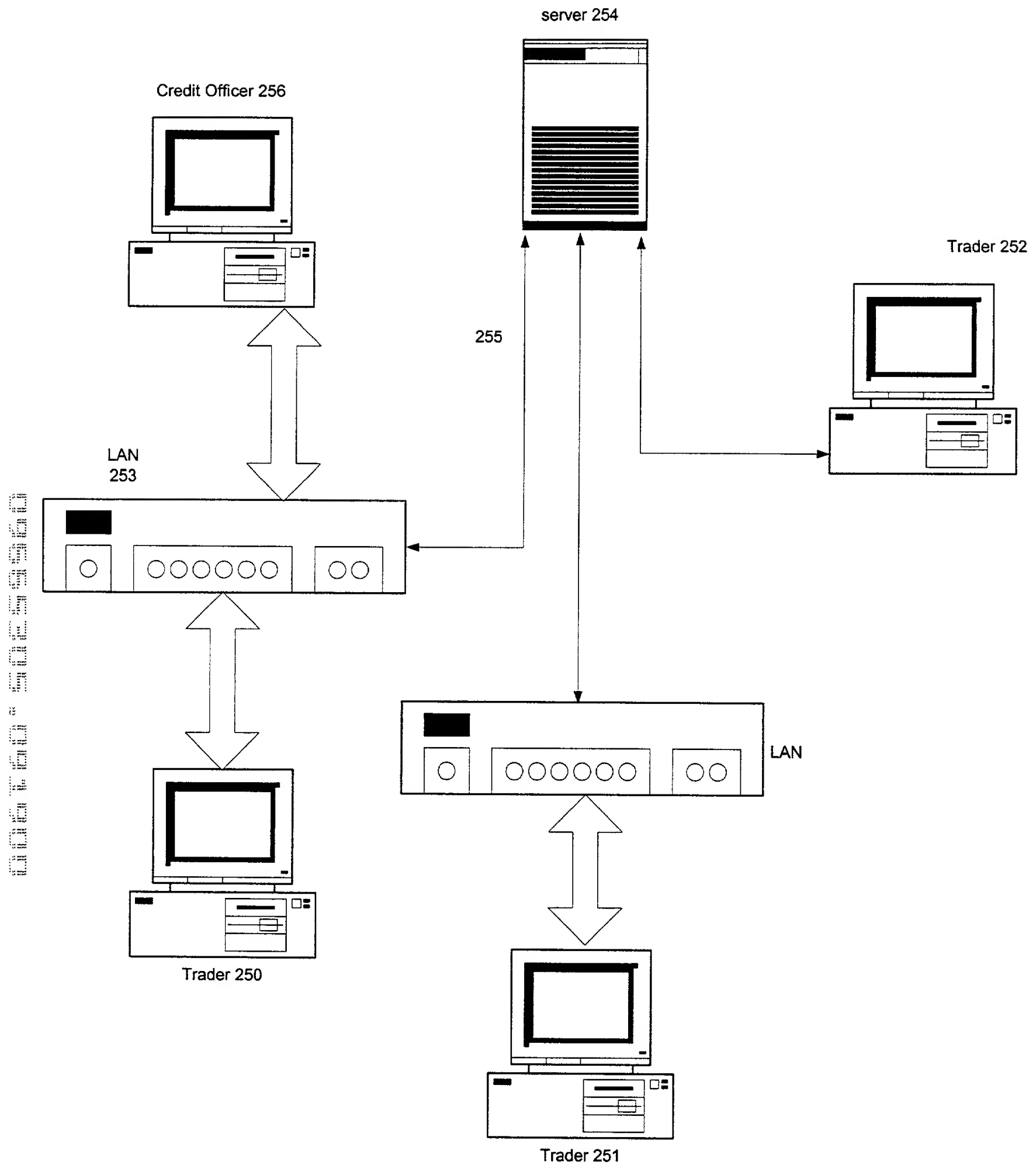Trader 252

255

LAN
253

LAN

Trader 250

Trader 251

Figure 11

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship is as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Method And System of Managing Credit for the
Electronic Trading of Financial Instruments

the specification of which (check only one item below)

[X]   is attached hereto.

[ ]   was filed as United States Application
      on _____
      Serial Number _____
      and was amended on _____
[ ]   was filed as PCT international application
      on _____
      Number _____
      and was amended on _____

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with 37 C.F.R. 1.56 (a).

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(b) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate, or any PCT international application on this invention filed me or my legal representatives or assignees and having a filing date before that of the application on which priority is claimed.

Foreign Application Number(s)	Country	Filing Date	Priority Claimed - (Yes or No)

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date

POWER OF ATTORNEY

As a named Inventor, I hereby appoint the following attorneys, with full power of substitution and revocation, to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith:

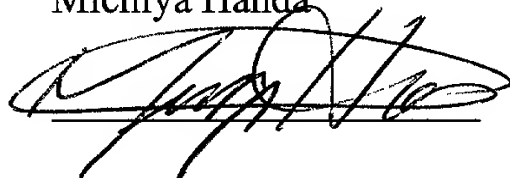| Attorney	Registration No.
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Inventor Residence and
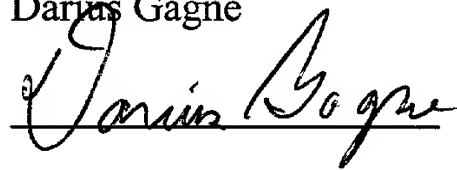Post Office Address: 230 East 26th Street, #1A
                          New York, NY 10010

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Joint Inventor: Darius Gagne

Inventor's signature: Date signed: Sep 15, 2000

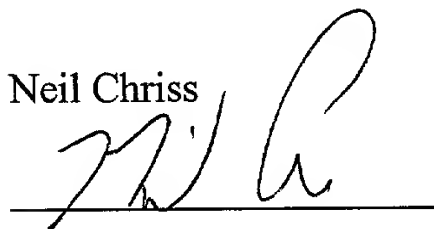3

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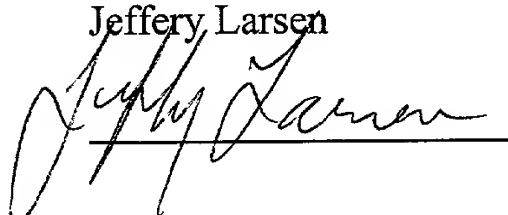 Post Office Address: 121 Reade Street, #10B
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